The Radula, Egg Capsules and Young of

Murex (Chicoreus) torrefactus SOWERBY

(Mollusca : Gastropoda)

BY

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(6 Text figures)

THE SHELLS AND SEVERAL LOTS of egg masses of *Murex (Chicoreus) torrefactus* SOWERBY, 1840, used in this study, have been collected at various localities in the North of Viti Levu, Fiji Islands. This species of *Murex* is rather common in this particular region and is especially prolific in muddy sand localities. The species inhabits primarily the intertidal zone and is found attached to the underside of coral rocks, in one instance as many as 16 specimens were found under a single coral boulder.

THE SHELL AND ANIMAL

Murex (Chicoreus) torrefactus SOWERBY, 1840

1840. *Murex torrefactus* SOWERBY, Proc. Zool. Soc. London for 1840: 141

1841. *Murex torrefactus* SOWERBY, Conch. Illust., fig. 120

1959. *Murex (Chicoreus) torrefactus* SOWERBY, KIRA, Col. shells Japan 1: 57; pl. 22, fig. 14 (recent colour photograph)

The shells are generally dark grey, blackish-grey or greyish-brown, with very small specimens often brick-red or orange-brown in colour. The interior of the aperture in adults will vary from white to bluish-white, cream or yellow; in some specimens the edge of the columella and the prominent teeth on the labrum (10 - 16) are bright rose in colour. The species occasionally attains a length of 80 mm in the Fiji Islands; however, the majority of specimens vary between 55 mm and 60 mm. Fiji specimens usually have shorter fronds than the specimen depicted by KIRA (1959).

The animal has a strongly muscular foot that is dark brownish-grey in colour, and carries a solid corneous dark brown operculum. The siphon is creamy-yellow, stained with blackish-grey at the distal end; the tentacles are short and moderately thick, grey mottled with white; the eyes are simple and black.

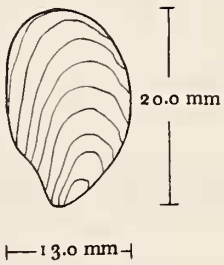

Figure 1
Operculum of *Murex torrefactus* SOWERBY (in shell 70.0 mm long)

THE RADULA

The radula is rhachiglossate and of triserial structure; the odontophore is long and narrow, translucent white in colour, 14 mm long and 0.35 mm wide in a shell 70 mm in length. The fully formed rows of teeth number 218 (plus 36 nascentes), and the lateral teeth partly overlap the rhachidians. The first ten to twelve rows of teeth are badly worn, with the cusps almost worn down to their bases. The rhachidians are convex in front, concavely depressed at the bottom and wider than they are long; the central plate has three prominent arched cusps and an intermediate denticle on each side of the large central cusp; the two side-cusps are equal-sized and slightly broader than the central cusp. The edges of the plate are pointed, and most probably function as accessory cutting edges, in view of their being blunted in the first rows of the ribbon. Laterals are slightly smaller than the rhachidians, simple, curved and sickle-shaped.

The radula of *Murex torrefactus* is similar in pattern to that of *M. ramosus* LINNAEUS, 1758, which is the type of the subgenus *Chicoreus* MONTFORT, 1810.

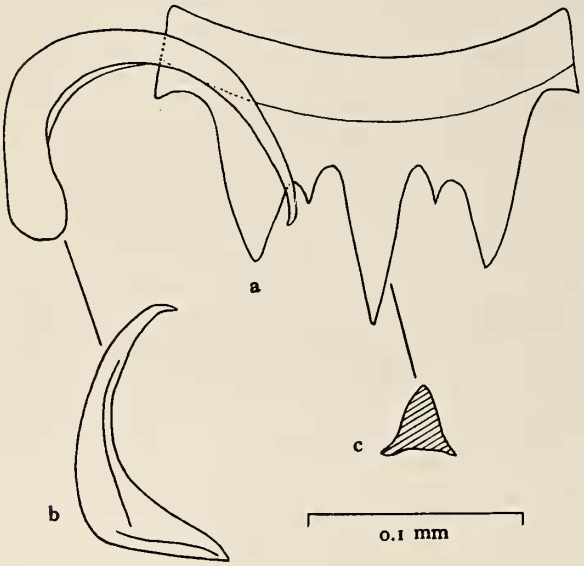

Figure 2
Murex torrefactus SOWERBY from Vatia Wharf, Fiji Islands
a. half row of radula b. side view of lateral tooth
c. profile of central cusp

OTHER ANATOMICAL FEATURES

The penis is light orange-brown in colour, transversely irregularly lined and variegated with dark brown; it is about 10 mm long when fully extended, and the distal end of the verge is 0.5 mm in diameter.

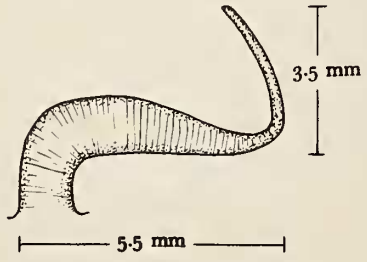

Figure 3
Penis of *Murex torrefactus* SOWERBY

THE EGG MASS AND THE EGG CAPSULES

Spawning of *Murex torrefactus* is not at all seasonal in Fiji, and observations recorded for the last five years do not suggest any seasonal peak activity in spawning. Egg masses are rather abundant in muddy sand localities, and capsules are attached in small or large clusters to the underside of coral boulders in the intertidal zone. Egg clusters include from 30 to 175 capsules, which are firmly anchored to the substratum; as many as three separate clusters in various stages of development have been found under a single rock. The female frequently broods the egg mass; however, in some instances the females were assisted by the males of the species.

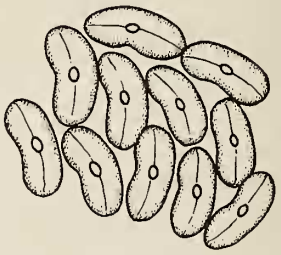

Figure 4
Dorsal View of Egg Clusters of *Murex torrefactus* SOWERBY

Egg capsules are vase-shaped, 5 - 7 mm in height and 4 - 5 mm in width; the oval or round, centrally placed "escape hatch" from which the young emerge at the crawling stage is 1.2 - 1.4 mm in diameter, and covered by a strong hymen. The egg capsules are tough and pliable, cream-coloured and attached by a flange to the substratum; one side at the top of the capsule is concavely depressed and sutures run approximately through the centre and sides of the capsule. The capsules are moderately translucent, and the eggs can be observed through the walls.

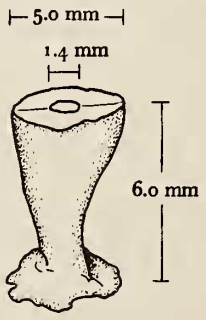

Figure 5
Egg Capsule of *Murex torrefactus* SOWERBY

Capsules contain from 30 - 60 spherical creamy-white eggs, suspended in a nutritive albumen and surrounded

by a very thin translucent membrane. Fertilized eggs varied only slightly in size and ranged from 480μ to 520μ in diameter; in some spawn clusters, eggs were in an early stage of cleavage. At the onset of hatching, the hymen covering the escape hatch dissolves; embryonic shells on emergence of the animal, were orange-brown to dark brown in colour, smooth, and consisting of two and one-half to three and one-third whorls with a produced anterior canal. Newly hatched shells were extremely fragile, and measured from 1.8 - 2.0 mm in length and from 1.1 to 1.2 mm in width. The majority of capsules contained from 6 - 7 embryos, while only a few contained 8 or 12, and only one capsule produced 5; after hatching there remained no trace of nurse eggs.

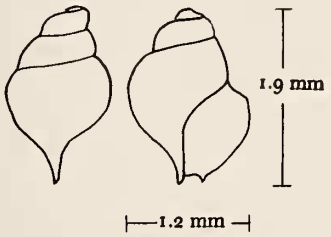

Figure 6
Newly Hatched Embryonic Shells of *Murex torrefactus* SOWERBY

LITERATURE CITED

KIRA, TETSUAKI
1959. Coloured illustrations of the shells of Japan. Rev. ed., Hoikusha, Osaka, 1: 1 - 239; 71 plts.